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2-28-04
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Appeal
Brief

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s) : Yuchun Wang, Rajeev Bajaj and
Fred C. Redeker

Serial No. : 09/843,582

Filed : April 26, 2001

For : ION EXCHANGE PAD OR BRUSH AND METHOD OF
REGENERATING THE SAME

Examiner : Dung V. Nguyen

Group Art Unit : 3723

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Commissioner for Patents
P.O. Box 1450
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APPELLANTS' BRIEF

Dear Sir:

Appellants hereby appeal to the Board of Patent Appeals and Interferences from the decision of the Examiner in the Final Office Action dated April 17, 2003, rejecting claims 14-20.

REAL PARTY IN INTEREST:

The present application is assigned to Applied Materials, Inc., 3050 Bowers Avenue, Santa Clara, California 95054.

RELATED APPEALS AND INTERFERENCES:

No other appeals or interferences are known to the Appellants, to the Appellants' legal representative, or to the Assignee which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

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STATUS OF THE CLAIMS:

Claims 14, 19 and 20 are pending, claims 15-18 having been canceled without prejudice in an amendment filed concurrently. Claims 14, 19 and 20 are independent claims.

Claims 14, 19 and 20 stand finally rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,844,030 to Andros (hereinafter "Andros").

Claims 14, 19 and 20 are being appealed.

STATUS OF AMENDMENTS:

An amendment filed concurrently with the present appeal brief and canceling claims 15-18 awaits entry by the Examiner. No amendments relative to claims 14, 19 and 20 have been filed.

SUMMARY OF THE INVENTION:

Appellants invention relates to brushes that employ complexing agents such as chelating reagents. (Appellants' Specification, page 2, lines 6-9). For example, complexing agents may be chemically grafted on a brush, may be resin beads physically blended with brush materials, or the brush may be made of a homogeneous complexing polymer. (Appellants' Specification, page 2, lines 9-13). The immobilized complexing agents (e.g., solid phase complexing agents) on the brush can effectively pick up metal ions (e.g., copper ions) or metal oxides (e.g., copper oxide) from a substrate surface upon contact but may not etch into metal lines. (Appellants' Specification, page 2, lines 14-18). For example, chelating reagents may bond with copper ions with sufficient strength to avoid the reloading of copper onto a substrate surface. (Appellants' Specification, page 2, lines 18-21). Use of the inventive brushes may simplify cleaning and/or polishing solution handling and may reduce cleaning and/or polishing waste generation. (Appellants' Specification, page 2, lines 21-23).

ISSUES:

1. Whether claims 14, 19 and 20 are anticipated under 35 U.S.C. §102(b) by Andros?

GROUPING OF THE CLAIMS:

Claims 14, 19 and 20 relate to Issue 1. No other claims are being appealed.

ARGUMENTS:ISSUE 135 U.S.C. §102(b) Rejection
of Claims 14, 19 and 20 over Andros

The final rejection of claims 14, 19 and 20 under 35 U.S.C. §102(b) is improper because Andros does not disclose a brush that includes a "complexing agent adapted to chemically bond to metal particles," as required by claims 14, 19 and 20. For example, claim 14 requires a *scrubber brush having a complexing agent coupled to a scrubber brush surface, the complexing agent adapted to chemically bond to metal particles.* Claim 20 similarly requires a *brush having a complexing agent coupled to a brush surface, the complexing agent adapted to chemically bond to metal particles.* Claim 19 requires a *scrubber brush comprised of a homogeneous material comprising a complexing agent adapted to chemically bond to metal particles.*

The Andros reference describes use of "an ionically charged sponge material for attracting and for retaining charged particles." (Andros, column 2, lines 46-47, emphasis added). Such sponge material may include ionic hydroxylated polymers cross-linked to hydroxylated polymers. (Andros, column 2, lines 47-49). The Andros reference specifically states that "the most effective means of removing ultra-fine particles from hydrophobic

surfaces, such as the surfaces of semiconductor wafers and memory disks, is by attracting and retaining the particles." (Andros, column 4, lines 37-40, emphasis added). Most notably, the Andros reference discloses the use of electrostatic attraction during wafer cleaning, not the use of complexing agents that chemically bond to metal particles, as required by claims 14, 19 and 20

In the final Office Action dated April 17, 2003, the Examiner states that the Andros reference discloses a "complexing agent adapted to chemically bond to metal particles and not by electrostatic attraction" in column 4, lines 37-55. Column 4, lines 37-55 of the Andros reference state:

It has been determined that the most effective means of removing ultra-fine particles from hydrophobic surfaces, such as the surfaces of semiconductor wafers and memory disks, is by attracting and retaining the particles. PVA sponges are inadequate for this purpose, relying solely on mechanically removing particles. The electrostatic force or vand der Waals force which binds fine particles to a hydrophobic surface are not easily or satisfactorily overcome by mechanical means. Cationic sponge is created according to the teachings of the present invention, by cross-linking an hydroxylated polymer, preferably a PVA molecule to a cationic hydroxylated polymer, preferably a cationic polyvinyl alcohol molecule, thereby forming a micro-porous sponge material capable of attracting and removing charged particles, including ultra-fine particles. Formation of the cationic sponge consists of first forming cationic PVA. This is accomplished by forming an epoxide and reacting it with PVA to Produce cationic PVA. [emphasis added.]

Appellants respectfully submit that the above statements of the Andros reference do not disclose use of a complexing agent "adapted to chemically bond to metal particles and not by electrostatic attraction" as stated by the Examiner. The materials described above are not complexing agents that chemically bond to metal particles. Also, the Andros reference teaches forming a micro-porous sponge material

capable of attracting charge particles. That is, the Andros reference does not teach use of a complexing agent for forming a chemical bond to metal particles. As stated, claim 14 requires a *scrubber brush having a complexing agent coupled to a scrubber brush surface, the complexing agent adapted to chemically bond to metal particles.* Claim 20 similarly requires a *brush having a complexing agent coupled to a brush surface, the complexing agent adapted to chemically bond to metal particles.* Claim 19 requires a *scrubber brush comprised of a homogeneous material comprising a complexing agent adapted to chemically bond to metal particles.* Appellants respectfully submit that these limitations are not disclosed by the Andros reference, and that claims 14, 19 and 20 are not anticipated by the Andros reference.

As stated in the Manual of Patent Examining Procedure (MPEP), “[a] claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference.” MPEP 2131. Because the Andros reference fails to disclose the use of a complexing agent adapted to chemically bond to metal particles as set forth in claims 14, 19 and 20, Appellants respectfully submit that these claims are not anticipated by the Andros reference.

Conclusion

As demonstrated above, each of claims 14, 19 and 20 recites one or more limitations not present in the Andros reference. For at least this reason, Appellants respectfully submit that the appealed claims are allowable over the Andros reference.

Please charge deposit account no. 04-1696 in the amount of \$330.00 to cover the cost of filing Appellants' Brief,

and \$420.00 for the two-month extension fee. A separate Request for Two-Month Extension of Time is enclosed. Appellants do not believe any other fees are due regarding this Brief. However, if any additional fees are required, please charge deposit account no. 04-1696.

Respectfully Submitted,



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Dated: February 17, 2004
Tarrytown, New York

APPENDIX

14. A brush apparatus comprising:

a scrubber brush having:

a surface adapted to contact a surface of a substrate to be scrubbed; and

a complexing agent coupled to the scrubber brush surface, the complexing agent adapted to chemically bond to metal particles.

19. An apparatus comprising:

a scrubber brush comprised of a homogeneous material comprising a complexing agent adapted to chemically bond to metal particles, and having a surface adapted to contact a surface of a substrate to be scrubbed.

20. A scrubber comprising:

a substrate support adapted to support a substrate;

a brush coupled so as to contact a substrate supported by the substrate support, the brush having:

a surface adapted to contact a surface of a substrate to be scrubbed; and

a complexing agent coupled to the brush surface, the complexing agent adapted to chemically bond to metal particles; and

a mechanism adapted to generate relative movement between the substrate and the brush.